CLAIMS

What is claimed is:

1. A pump assembly for an implantable prosthesis, comprising:
   a housing having an outer wall with at least a portion of the outer wall being compressible;
   a first flow valve positioned within the housing and having a seated and an unseated position; and
   a bar positioned within the housing and moveable between a first and a second position so that when the bar is moved from the first position to the second position the bar causes the first flow valve to move from the seated to the unseated position.

2. The pump assembly of claim 1, wherein the outer wall further comprises:
   a first compressible side wall positioned to intersect an axis defined by a path of travel of the first flow valve from the seated to the unseated position;
   a second compressible side wall adjacent to the first compressible side wall, located such that a first portion of the bar is adjacent to the first compressible side wall and a second portion of the bar is adjacent to the second compressible side wall so that if either the first or the second compressible side wall is compressed, the bar is caused to engage the first flow valve and move the first flow valve from the seated to the unseated position.

3. The pump assembly of claim 2 wherein the housing has a substantially rectangular configuration with the first compressible side wall being shorter than the second compressible side wall.

4. The pump assembly of claim 3 wherein the second portion of the bar is substantially parallel with the second compressible side wall when the second compressible side wall is in an uncompressed state.

5. The pump assembly of claim 4 wherein an interior angle formed between the first portion of the bar and the second portion of the bar is obtuse.

6. The pump assembly of claim 2 wherein the bar includes stainless steel.

7. The pump assembly of claim 2 wherein the bar includes plastic.

8. The pump assembly of claim 3 wherein the first portion of the bar includes a curved free end wherein a curvature of the free end operatively associates with a curvature of the first flow valve.

9. The pump assembly of claim 8 wherein the curvature of the free end also operatively associates with a curvature of an interior portion of the outer wall.

10. The pump assembly of claim 2, further comprising:

a pump bulb coupled to the housing, wherein the pump bulb has a first exterior texture and the housing has a second exterior texture that is different than the first exterior texture.

11. The pump of claim 10 wherein the second exterior texture includes a plurality of raised panels.

12. The pump of claim 11 wherein the raised panels are circular.

13. The pump assembly of claim 2 further comprising a second flow valve positioned such that when the first flow valve is moved from the seated to the unseated position, the first flow valve contacts the second flow valve and moves the second flow valve from a seated to an unseated position.

14. An implantable prosthesis, comprising:

a housing having a generally rectangular configuration defined by a first and a second minor side wall and a first and a second major side wall

wherein the major side walls are longer than the minor side walls, wherein at least one of the major side walls and at least one of the minor side walls is compressible;

a first flow valve located within the housing and oriented to be generally parallel with the major side wall and perpendicular to the minor side walls; and

a bar located within the housing having a first portion that is substantially parallel to the compressible major side wall and a second portion that is angled toward the compressible minor side wall in proximity to the first flow valve so that a compression of either the compressible major side wall or the compressible minor side wall causes the bar to move so that the second portion contacts the first flow valve and moves it from a seated position to an unseated position.

15. The implantable prosthesis of claim 14, further comprising:

a valve block located within the housing that supports and retains the first flow valve and retains the first portion of the bar;

a recess within the valve block to receive the first portion of the bar as it is moved by a compression of either the compressible major or minor side wall; and

a tab formed by a portion of the valve block wherein the tab is deflectable into the recess.

16. The implantable prosthesis of claim 14, further comprising:

a pump bulb coupled to the housing, wherein the pump bulb has a first exterior texture and the housing has a second exterior texture that is different than the first exterior texture.

17. The implantable prosthesis of claim 16 wherein the second exterior texture includes a plurality of raised panels.

18. The implantable prosthesis of claim 17 wherein the raised panels are circular.

19. The implantable prosthesis of claim 14 wherein the bar includes stainless steel.

20. A method of using an inflatable implanted prosthesis comprising:

implanting an inflatable prosthesis into a patient, said prosthesis including a pump assembly;

inflating said prosthesis with a pump included in said pump assembly; and,

randomly selecting any opposing surfaces on the periphery of said pump assembly;

compressing said randomly selected opposing surfaces of said pump assembly so as to deflate said prosthesis.

21. A method as set forth in claim 20, wherein compressing includes moving a check valve internal to said pump into a position to allow said prosthesis to become deflated.

22. A method as set forth in claim 21, wherein compressing includes directly contacting said check valve through patient tissue.

23. A method as set forth in claims 22, wherein said compressing includes indirectly contacting said check valve outside of patient tissue.

24. A method as set forth in claim 22, wherein compressing includes compressing two opposing surfaces that extend along a length of said pump assembly.

25. A method as set forth in claim 22, wherein compressing includes compressing two opposing surfaces that extend along a width of said pump assembly.

26. A method as set forth in claim 20, wherein said pump assembly has a deflation actuator positioned within said pump assembly, said deflation actuator extending along the length of said pump assembly.

27. A method as set forth in claim 26, wherein said deflation actuator includes a

valve actuation bar.

28. An inflatable implantable prosthesis comprising:

a pump assembly;

said pump assembly including a pump bulb;

said pump assembly including at least one internal check valve in a pathway extending from said pump bulb to an inflatable portion of said prosthetic;

said pump assembly including an actuator arm mechanically linking any randomly selected external surface of said pump assembly to one end of said at least one internal check valve.

29. A prosthesis as set forth in claim 28, wherein said actuator arm includes a first portion that extends along a length of said pump assembly and a second portion that extends at an angle to said first portion toward said at least one internal check valve.

30. A prosthesis as set forth in claim 28, wherein a portion of said pump assembly has an external textured surface different than an external surface of the pump bulb.

31. A prosthesis as set forth in claim 28, wherein said pump bulb is of a different size and shape from the rest of the pump assembly.

32. A method of making a pump and valve assembly for an inflatable prosthesis, comprising:

providing a valve block having at least one actuable valve;

providing a shell including a pump bulb component; and

attaching the shell to the valve block to complete the pump and valve assembly.

33. A method of manufacturing a pump and valve assembly for an inflatable prosthesis, comprising:

molding a unitary valve block;

inserting at least one valve;

molding a unitary shell including a pump bulb component; and

joining the shell to the valve block to complete the pump and valve assembly without requiring any other components to be joined thereto.

34. A pump and valve assembly for an inflatable prosthesis, comprising:

a unitary molded valve block; and

a unitary molded shell attached to the valve block wherein the shell include a pump bulb.

35. A pump assembly for an implantable prosthesis, comprising:

a housing having an outer wall with at least a portion of the outer wall being compressible;

a first flow valve positioned within the housing and having a seated and an unseated position; and

a bar positioned within the housing, the bar comprising a spring and being moveable between a first and a second position so that when the bar is moved from the first position to the second position the bar causes the first flow valve to move from the seated to the unseated position.

36. The assembly of claim 35 wherein the bar has a bend connecting a first portion and a second portion of the bar, at least one rib extending the first and second portions of the bar such that the bend augments the spring,

the outer wall further comprising:

a first compressible side wall positioned to intersect an axis defined by a path of travel of the first flow valve from the seated to the unseated position; and

a second compressible side wall adjacent to the first compressible side wall, located such that the first portion of the bar is adjacent to the first compressible side wall and the second portion of the bar is adjacent to the second compressible side wall so that if either the first or the

second compressible side wall is compressed, the bar causes the first flow valve to move from the seated to the unseated position.

37. The assembly of claim 36 wherein the bar is a thin elongate member, an end portion of the second portion of the bar engaging an end of the first flow valve when the bar is in the first position.

38. The assembly of claim 36 wherein the second portion of the bar is substantially parallel with the second compressible side wall when the second compressible side wall is in an uncompressed state.

39. The assembly of claim 38 wherein the at least one rib extending across the bend is shaped to as to make the bar stiff, such that resistance to deflection forces is enhanced.

40. The assembly of claim 39 wherein the first portion of the bar comprises at least one rib centrally located on thereon, such that the when the first portion of the bar is compressed by the first compressible side wall compression forces exerted on the first portion of the bar are distributed substantially evenly along the first portion of the bar.

41. The assembly of claim 35 wherein the first flow valve comprises a synthetic portion and a metal portion.

42. The assembly of claim 37 wherein a segment of the first flow valve includes a plastic member disposed thereon such that the bar contacts the plastic member when the bar is in the first position.

43. The assembly of claim 36 further comprising a support member coupled to the housing, wherein the support member contacts a portion of the first flow valve in such as manner as to prevent sideways movement of the first flow valve.

44. The assembly of claim 43 wherein the support member further comprises a shelf in contact with the first flow valve.

45. The pump assembly of claim 36 further comprising a second flow valve positioned such that when the first flow valve is moved from the seated to the unseated position, the first flow valve contacts the second flow valve and moves the second flow valve from a seated to an unseated position.

46. An implantable prosthesis, comprising:

a housing having a generally rectangular configuration defined by a first and a second minor side wall and a first and a second major side wall wherein the major side walls are longer than the minor side walls, and wherein at least one of the major side walls and at least one of the minor side walls is compressible;

a first flow valve located within the housing and oriented to be generally parallel with the major side wall and perpendicular to the minor side walls; and

a bar located within the housing having a first portion that is substantially parallel to the compressible major side wall and a second portion that is angled toward the compressible minor side wall in proximity to the first flow valve so that a compression of either the compressible major side wall or the compressible minor side wall causes an actuating arm to cause the bar to move so that the second portion contacts the first flow valve and moves the flow valve from a seated position to an unseated position.

47. The implantable prosthesis of claim 46 further comprising:

a valve block located within the housing that supports and retains the first flow valve;

a recess within the valve block to receive and retain the first portion of the bar as it is moved by a compression of either the compressible major or minor side wall; and

a support member coupled to the housing such that a portion contacts a portion of the first flow valve.

48. The implantable prosthesis of claim 46, further comprising:

a pump bulb coupled to the housing, wherein the pump bulb has a first exterior texture and the housing has a second exterior texture that is different than the first exterior texture; and

the bar further comprising at least one rib extending across said bend.

49. The implantable prosthesis of claim 47 wherein the support member has a shelf, the shelf contacting a portion of the first flow valve in such a manner as to resist sideways movement of the first flow valve when the flow valve is moving between the seated and unseated positions.

50. A method of using an inflatable prosthesis comprising:

implanting an inflatable prosthesis into a patient, said prosthesis including a pump assembly;

inflating said prosthesis with a pump included in said pump assembly;

when deflation is desired, randomly selecting surfaces on the periphery of said pump assembly; and

physically compressing said randomly selected surfaces of said pump assembly so as to deflate said prosthesis, wherein the surfaces activate a bar which permits a check valve to move from a seated position, permitting the flow of fluid back into a reservoir.

51. A method as set forth in claim 50 wherein the step of compressing includes the step of moving a bar which causes a check valve internal to said pump to move into a position to allow said prosthesis to become deflated.

52. A method as set forth in claim 51 wherein the step of compressing includes the step of preventing the sideways movement of the check valve.

53. A method as set forth in claims 52, wherein said step of compressing includes the step of indirectly contacting said check valve outside of patient tissue.

54. A method as set forth in claim 25, wherein the step of compressing includes the step of compressing two opposing surfaces that extend along a length of said pump assembly.

55. A bar for incorporation into an inflatable implantable prosthesis which has a pump assembly including a pump bulb and at least one internal check valve in a pathway extending from said pump bulb to an inflatable portion of said prosthesis, said bar comprising:

a thin elongate member having a first portion connected to a second portion by a bend, the bend forming a spring such that a spring force may be exerted to mechanically link randomly selected external surfaces of said pump assembly to one end of said at least one internal check valve;

at least one first rib extending across the bend to resist deformation of the bend and prevent diminishment of the spring stiffness; and

at least one second rib located on the first portion of the bar such that when the first portion of the bar is compressed, compression forces exerted on the first portion of the bar are distributed along the first portion of the bar.

56. The bar of claim 55, wherein the first and second ribs are discontinuities in the bar shaped to resist deformation.

57. The bar of claim 56, wherein the at least one second rib is a spoon-shaped element located in a central area of the first portion of the bar.

58. A support member for an inflatable implantable prosthesis that includes a pump assembly, and at least one internal check valve in a pathway extending from a pump bulb to an inflatable portion of the prosthesis, said support member coupleable to the pump assembly, the support member comprising a shelf for mechanical interaction with the internal check valve to resist transverse motion of the internal check valve.

59. A method of making a pump and valve assembly for an inflatable prosthesis, comprising:

providing a valve block having at least one actuable valve, the valve made of a metal material with a segment of the valve covered by a plastic material;

providing a shell including a pump bulb component;

providing a bar having two portions connected by a bend having at least one rib;

providing a support member having a shelf, the shelf preventing transverse movement of the valve; and

attaching the shell to the valve block to complete the pump and valve assembly.

60. An internal check valve for an inflatable implantable prosthesis, wherein the inflatable prosthesis comprises a pump assembly including a pump bulb and a pathway extending from said pump bulb to an inflatable portion of said prosthesis, a bar having at least one rib extending across a bend, and a support member with a shelf, said internal check valve being sized and shaped to be insertable within said

pump assembly, and being made of a metal material with a segment of the internal check valve having a plastic material disposed thereon, such that when assembled, the plastic material of the check valve is adapted to engage a portion of the bar and the shelf of the support member.